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MUSEUM OF APPLIED SCIENCE OF VICTORIA

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SILK CULTURE.

PRACTICAL INSTRUCTION

ON

SILK CULTURE,

From the planting of the Mulberry ~~Leaves~~ trees up to the Production of the Cocoons and Silk-worm Eggs, or so called "graine," for the following season.

By LEONARD POZZI,

252 ~~40~~ JOHNSTON STREET, FITZROY, MELBOURNE.

1894.

Fitzroy:

Robert Barr, Printer, 105 & 107 Brunswick-street.

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With Signed Poppies Compliments

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Observations.

THE world produces annually about £70,000,000 worth of silk, the principal silk-producing countries being China, Italy, France, Switzerland, Spain, Turkey, Russia, America, India, Persia and Austria. Considering the climate and condition of the above countries, there is no excuse whatever why the Australian colonies should not undertake the industry, having equal, if not superior, natural advantages of any of the above countries.

An attempt was made in 1876 for the introduction of silk culture into this colony, in which the principal mover was a lady by the name of Mrs. Bladen-Neill, who nobly worked hard, and the Government gave her substantial assistance, besides public sympathy and money;—but unfortunately it ended in failure, for the simple reason that instead of adopting and advocating the cottage silk-culture system, for its introduction into a new country, Mrs. Neill formed a joint-stock company, which besides wasting large sums of money on salaries and on useless formalities, silk-worms were actually introduced before the planting of the necessary mulberry trees, and this bad result had the effect of retarding the industry ever since. A similar mistake was made many years ago in the United States, and had a deterrent effect for about 40 years.

If Mrs. Neill had adopted the cottage system in the same manner as the American Women's Silk Culture Association, that was formed in 1880, and recommended by myself for this colony through *The Age* columns, I have no doubt that her name with success would have been handed down to the present day.

For the last 17 years I am not aware of any attempt having been made for the introduction of silk-culture into Victoria, till mentioned by Sir George Verdon, President of the Fruit, Wine and Grain Exhibition, held on 23rd May, 1893, who in his opening address said :—"If the people will be content to make their homes in the country, and if their efforts are wisely directed, there need be no fear for the future of Australia; but an agreeable and interesting occupation seems to be one of the greatest necessities to make rural life attractive—as it is in Southern Europe. The ordinary work of the farmers, who grow nothing but cereals, perhaps lacks this quality; but if there be added a dairy, an orchard, a garden and the cultivation of silk, there would be pleasant employment for women and the growing family, while the profit of the farm would be greatly increased." That expression of Sir George Verdon gave me the opportunity of making a starting point to expand my practical knowledge of the silk-culture; consisting of from the propagation of the mulberry trees up to the production of the cocoons, and silk-worm eggs for the following season. On the 18th of April, 1893, I published my first letter on this subject, which appeared in *The Age*; putting forward my conviction of the importance of silk-culture for this colony, and suggesting the most economical and best method to be adopted—that is, the cottage silk-culture method. The great success of the United States has been obtained by adopting the same method.

An association was formed in 1880, which was called the American Women's Silk-culture Association, with a membership of 100 women and 50 men. To all these ladies the practical knowledge of silk-culture was unknown; but by the engagement of some practical silk culturist, they soon learned sufficient to educate the farmers of that country. An appeal was made by that association to the Government for a grant to enable them to go into the country and expand silk-culture education. The Government granted $5000, which was repeated yearly, and greatly assisted the Association. In 1888 a bill was passed for a Government grant of $150,000 to aid and foster the silk industry in the States, combined with a protective tariff, which gave great stimulus and marvellous results. In 1880 the total number of hands employed was 12,599, and in 1890 30,000. Goods produced, in 1880, $30,000,000, and in 1890, $69,000,000. In 1880, $4,066,990 were paid in wages, and in 1890 double that amount; being an increase of more than 100 per cent. in 10 years, with 385 mills of the most superior class.

Propagation of Mulberry Trees.

The first thing to do in the introduction of silk-culture into a new country is to propagate the mulberry trees. Mulberry trees are grown by seeds, by cuttings, and by layers or suckers, and are hardy trees, and grow and prosper well, especially in the Australian colonies. I have been informed that the mulberry will grow in Australia in three years what it will take five years in Europe. Any good land adapted for fruit trees is suitable for mulberries. Hillside land, sloping towards the east, south-east or south, and protected on the north and north-west by plantations, buildings, etc., and in dry, sandy, loamy soil, are the conditions suitable to grow mulberries; a cold, damp, or heavy soil will not answer. Mulberry trees can be planted for ornamenting and shading purposes—around houses, yards, all along roads and streets, parks, gardens, etc.

The cultivation of mulberries is carried out in different ways. The system generally used in Europe is as follows:—The trees are planted at a distance of about 30ft. apart, and the stalk of the trees kept at about seven feet high, and no branches are allowed to grow on the stalk below the seven feet. In planting the trees at 30ft. apart, it will enable the owner to utilize the land to grow other crops, such as potatoes, wheat, maize, oats, hemp, vegetables, etc.; but if the land is utilized for mulberry trees only, the trees are generally planted at about 12ft. apart, and grown up to about a three-feet stalk. In case of any mulberry trees growing crooked, they must be trained up straight by applying a pole tied to the stalk. The trees are also planted for hedges. The plants are usually grown by seed, and in the second year transplanted one foot apart, with a stalk about 18in. high, and in two years afterwards the leaves can be utilized to feed the silk-worms. Hedges are formed principally with wild trees of the rose-leaf variety. The trees require manuring, except in rich, new soil, and where the land is manured, for the under-crop; they will not damage the new growing crop the same as other trees, on account of the leaves being taken off in spring-time, when the crop is in full growth, and

before the second leaves are full grown, the under crop is very near matured. Trees cultivated with a high stalk are generally grafted, and when they are well cultivated and properly pruned every two years, they will produce a greater quantity, larger and superior leaves, and easier collected. For every acre of land, if planted at 30ft. apart, there would be room for 48 trees and at 10ft. apart 435 trees. The trees are very hardy and become very old : it has been known of them growing for 400 years.

From mulberry trees there are other advantages besides feeding the silk-worms. The sawn timber from them is well adapted to make wine barrels. The wood can be used for fancy work, being very effective when polished. When the leaves are not stripped from the tree, it will produce good fruit for jam, etc. The second leaves that fall in autumn can be utilized for pigs' food. The leaves are gathered and stored away when dried, then boiled when wanted, and mixed with some farinaceous substance, which will prepare a good meal for pigs. A French gentleman, Monsieur F. Parisot, has discovered the means of utilizing the mulberry bark to be manufactured into paper, and again the pruning of the trees will supply firewood.

An ounce of mulberry seed contains about 12,000 grains, and about 10,000 young plants can be obtained from it.

Variety of Mulberries.

There are a great variety of mulberry trees, but I will not deal but with those commonly known and useful for our purpose, such as the Rosaefoglia (or rose-leaf), and the China Lou and the Multicaulis. The mulberry most recommended is the Morus Alba (rose-leaf grafted). This mulberry produces thin but substantial smooth green leaves, and easy to collect. if properly pruned; they contain a deal of the glutinous substance which gives tenacity and the best of silk. The China Lou is also recommended to be equal to the rose-leaf in substance and production of silk. It will grow well by cuttings. The cuttings are planted at one foot apart with one or two buds out of the ground, and next season they will be ready to be transplanted and grown and trained up to seven feet high. In one season a bud will grow as much as six and a half feet long, and after three years old, one tree will give as much as five pounds of leaves. The leaves are very large, and make a beautiful ornamental tree. The Multicaulis are sometimes used for hedges, and are very useful to feed the young silk-worms, on account of their budding earlier than other kinds of mulberry. The leaves are nice-looking and smooth, but very tender, and easily destroyed by frost, and silk-worms are not fed by Multicaulis leaves after the second stage. The Morus Alba (rose-leaf), grown from seed, is usually called the wild mulberry, as it has not been grafted. These trees can be grown to a very large size, and bear a good crop of leaves ; but the leaves are smaller than the grafted, while the result as regards silk production is almost equal to the grafted mulberry leaves.

In Switzerland some of these trees are purposely let grow wild, with full branches, when they become very useful in rainy weather; if rain continues for several days, the big branches of these trees are cut down, and put under a shelter to dry the water off the

leaves, and then used for feeding the worms, and the trees are then pruned in the usual way.

The system of grafting mulberry trees has been adopted only since the 17th century. Grafted trees are nothing else but the wild mulberries grown from seed that has been cultivated with care and perseverance, and brought to the production of superior leaves, and are now made use of for propagating by grafting on to trees raised from seed so as to obtain the same superior mulberries. Mulberries have been known to exist since 2600 years B.C. The wife of the Emperor of China, Hoang-Ti, was the first to introduce the silk industry. In the year 530 A.C. it was introduced into Europe.

Pruning.

Mulberry trees require to be pruned every two years. The trees are trained up to the height of about seven feet, and no branches are to be left growing on the stalk except from the intended height, where three or four branches are left—that is, out of the new shoots grown from the cutting of the stalk done on the previous season. These three or four branches are pruned, leaving three or four buds on each of them, and so year by year increasing the branches and forming a large tree. The centre of the tree is pruned in a manner so as to make it hollow, to leave room for a person to stand in it with a sack to gather in the leaves from all the branches. With proper pruning, the trees will grow vigorously and will produce a larger quantity of leaves of superior quality, and render its stripping easier, besides making a nice-looking tree. Mulberries for hedges are pruned every year by trimming the tops and sides of the trees: the clippings are then taken home and the leaves picked off in the usual way. It is calculated that the wood obtained from pruning will compensate the expense in using it for firewood.

Collecting and Preparing the Leaves.

Mulberry leaves are usually collected in the morning and evening. The morning is preferable. As soon as the leaves are brought home, no time should be lost in spreading them out in a dry, cool place, where they are assorted. All tender leaves, such as the tips of young shoots, which are very unwholesome for worms' food at any stage, also all dry leaves, and any kind of dirt must be carefully picked out. If the leaves be transported from a distance, care must be taken to send them with as quick dispatch as possible, for a long delay will cause the leaves to ferment. It is advisable to always keep a good supply of leaves on the premises, in case of rainy weather, especially after the third stage. Good leaves, such as the rose-leaf grafted, will keep in a good condition for several days. Sometimes they are kept as long as a week, and still be in a fair condition to feed the worms.

In Europe the mulberry trees are stripped of their leaves when five years old, and only once a year—and some persons strip only once every two years; but in the Australian colonies I believe that the mulberries can be utilized when three or four years old, because they grow quicker than in Europe. Some Italians who have started silk-culture in New South Wales, in a place called the Little Italian

Settlement, on the Richmond River, planted mulberry cuttings, some of which grew three feet in height in the first year.

All the useless young shoots taken off in springtime in cultivating the young trees can be utilized to feed the worms. In Europe a mulberry tree of nine years old, and of the rose-leaf variety grafted, will average about 110lbs. of leaves, but as they grow larger they will naturally produce more leaves in proportion to size. There are farmers who possess tree, but do not follow silk-culture, and simply sell the leaves to silk-culturists; and there are others who supply the leaves to sericulturists and divide the profits.

The sack used for gathering the leaves from the trees is made with a wooden or iron ring fastened to the mouth, so that it always remains open. A handle or rope is placed across also, with a hook attached to enable the gatherer to hang the sack on the tree while gathering the leaves.

Rooms for Silkworm Rearing.

The rooms for the cultivation of silkworms are generally built for other purposes, as well, when not required for silkworms. Stone and brick buildings are preferable to wooden ones; they must be provided with good ventilation, secured from rats, mice and ants, free from dampness, with windows to allow of a good light, with a chimney, if a small room, and more than one if required for the rearing of worms for more than one ounce of eggs. The windows must be provided with white curtains to prevent the direct rays of the sun on to the worms, which would be injurious.

Trays for Silkworms.

Trays are made of light wood, and usually about six to ten feet long, and 2 feet and three inches wide and three inches deep. The frame is made of timber one inch thick and three inches wide; the bottom is lined with laths of one inch by half an inch, and nailed at one and a quarter inch apart, supported by stairs of one by two inches, nailed across the frame at two feet apart. The trays are placed on racks at 18 inches distance one above the other, and the racks placed at about two and a half feet apart from one row to the other. The racks are fixed from the floor to the ceiling, and constructed in a manner to be easily removed, when they are no longer required. When the trays are properly placed, the bottom is covered with brown paper for the silkworms to rest on.

The space of trays wanted for one ounce of eggs is as follow :—

For the	1st	stage it would require		8	square feet.
,,	2nd	,,	,,	16	,,
,,	3rd	,,	,,	38	,,
,,	4th	,,	,,	90	,,
,,	5th	,,	,,	200	,,

Hatching of Silkworms' Eggs.

When the proper time arrives—that is, in springtime—when a sufficient supply of leaves can be obtained, the hatching process is undertaken. The eggs are usually laid by the moths on a cloth. In that case the cloth with the eggs on is immersed (folded up) several

times in lukewarm water, stirring it up and down for six or eight minutes for the purpose of softening the gum, to enable the operator to remove the eggs by scraping off the cloth with a wooden horn or a blunt bone knife. The eggs are washed clean with lukewarm water, and repeated until clean water is obtained. If any eggs be found floating they are worthless, consequently rejected, and the good ones are dried on blotting paper in the shade. When dry they are placed in a box four inches square for one ounce of eggs, and for a larger quantity, larger boxes are used in proportion. In our family we usually kept four ounces of eggs, and we hatched them in a small warm room by beginning at 64deg. F., second day 65deg., third day 66, fourth 68, fifth 71, 6th 73, and up to the 10th day 75 deg. The eggs are stirred three times a day with a palette or teaspoon, until you see some worms appear. After the young ones are born the temperature is gradually raised to 80 or 82 deg., and kept up to that degree to the first stage or moulting. As soon as the young ones appear perforated paper is laid on the worms, and mulberry leaves cut fine are spread on the perforated paper, when the newly-born will come through for a feed, which will enable the operator to easily remove them into the prepared place; do not feed them again until late in the afternoon. All the worms hatched are to be fed together and kept separate from others hatched later on, and the younger ones must be fed more than the first born for the purpose of equalising them. From birth to the first stage they are fed five times a day.

People who cultivate say from 5 to 60 oz. of eggs, have the hatching done in proper incubators, specially made. Some times farmers club together, and they hatch the eggs all at one place, by one person. There are also public places kept for that purpose. In hatching time, when the worms are very young, great care must be taken not to allow or cause a sudden change of temperature, which would be very injurious. Silkworms are generally born in the morning.

Silkworms.

There is a great variety of silkworms, but for our purpose it is only necessary to deal with the worms commonly used. There are two principal species, the one which produces white and the other yellow silk. The best for the production of white silk is the Lina, and the best for the yellow silk is the Phaloena Altus, which produces the greatest quantity of thread; but the species most commonly used in Europe is the Phaloena Bombyx, the Arbalestier and the Milanaise. When just born they are about one-eighth of an inch long, and of a black colour, and when full grown they are of a white colour, and about three inches long, and nearly 3in. in diameter.

Silkworms are subject to various diseases, and one of the worst is the silkworm rot or muscardine (in Italian called calcino).

The percentage of worms lost through sickness in Europe is calculated at about 20 per cent., whereas an experiment made in Christchurch, New Zealand, scarcely any loss was experienced; also in the little Italian settlement in New South Wales above-mentioned, where they cultivate the silkworms with great success, with most primitive appliances, and accommodation of the rudest kind, the worms kept upon old bags in bedrooms, kitchen, anywhere, in fact;

and yet under this rough treatment the worms prosper well. The length of the silkworms' life will greatly depend on the temperature that they have been reared under, and the sort of treatment received; but if properly governed, the following is the average of their life:—From birth to spinning the cocoon, 28 days; from the spinning to the piercing through of the cocoon, 22 days, and from the piercing of moth through the cocoons to the end of life (20 days); altogether 70 days, and out of this time they are fed about 28 days only, and live 42 days without any food whatever; but as soon as the moths are done laying the eggs they are destroyed.

With a very low temperature, moths can be kept alive in the cocoons from one season to the other, or for twelve months. This has been repeatedly proven. Silkworms possess eight legs and 12 eyes, nine holes near the legs on each side, which act as respirators, and the body is covered with a fine hair, visible only with a strong glass.

The silkworms undergo four transformations during the course of their life. First is the eggs; second, the worms; third, the chrysalis; fourth, the moths. Three days after the completion of the cocoon, the worm is transformed into a chrysalis, and in the course of about 15 days is transformed into a moth. When the worms are full grown it would take about eight to weigh one ounce.

Rearing the Silkworms.

When the silk-culturist has the necessary requirements, such as mulberries, habitation, and all necessary appliances and the eggs properly hatched, he would be in a position to start rearing the worms and undertake the simple art of silk culture. Cleanliness and good ventilation is of the most importance to be maintained right through the rearing of the silkworms, and also to carry out with due attention the regulations connected with the industry.

From birth up to the spinning of the cocoons, the silk-worms go through five stages, and moults or changes its skin four times. The duration of the five stages will depend on the temperature they are kept in, and the way that the worms are treated.

With a temperature of 85deg. F., and constant feeding, the five stages would end in about 20 days, and by lowering the degree to 66, and with scarcity of food, it would take from 40 to 50 days to accomplish the five stages. In adopting the above extreme way, it would end with bad results, and after much experience the proper time for the five stages is reckoned at about 30 days at about 73 degrees of temperature. The various stages are divided as follows:—First stage will last five days, second stage will last four days, third stage will last five days, the fourth stage will last six days, and the fifth stage will last eight days.

The following table will show the space occupied by the worms in their fast development:—

In the second stage the worms will occupy double the space of the first stage; in the third, four times of the second; in the fourth, eight times of the third; and the fifth, 16 times of the fourth.

In the first stage the worms are fed five times a day, and the leaves cut fine (say about one-sixteenth of an inch broad, and carefully and equally spread on top of the worms and only sufficient for

the worms to eat at one meal). If more leaves are put on than they can eat at one meal, it will accumulate too much refuse, or what is called "bed," besides wasting the mulberry leaves, and cause disease. The attention of this important matter is to be given in all stages. The first meal should be supplied early in the morning, and the last late at night. Fresh-collected leaves should never be supplied to the worms, as they are not so healthy as when half a day old. Particular attention is to be given to this, especially just before the worms start spinning the cocoons. On the fourth day of the first stage, or when they are four days old, the worms will begin to get into a state of lethargy or sleep, and if they have been properly equalized by feeding, etc., they will all be in a sleeping state within a short time of one another. At the same time the feeding must continue as long as there are some still awake or eating, but the supply of food must be gradually reduced to prevent the young worms being buried. After about 24 hours of sleep they begin to wake, and they then moult their skin. This moulting take place at every stage. Pending the sleeping time and moulting, special care should be taken that they are not disturbed. When about three fourths of the worms are through their moult and look lively again, perforated paper is placed over them and finely-cut leaves placed on top of the paper, when the worms will come up through the paper on to the mulberry leaves for a feed, and when the paper is loaded with worms, they are removed into clean trays.

The process of shifting or cleaning out the worms with the perforated paper is carried on up to the third stage, and for the last two stages netting is generally used, with holes of one inch square. There is also a very simple way, adopted by a large number of small farmers, that is, by putting small branches of mulberry leaves on the worms, and when the branches are loaded, worms and leaves are shifted and laid in the centre of the clean tray in a row (not scattered) covering about one-third of the surface and the full length of the tray, so that as they grow larger, there will be sufficient room for them to expand. This rule is to be observed in all the stages. The leaves for feeding are cut very fine at first, and gradually cut coarser up to the third stage, when they are cut about an inch broad. The leaves should be cut up only at each feeding, as otherwise they would get dry before the worms are fed.

After the first stage the worms are fed four times a day, or every six hours, beginning in the morning early and ending late at night. When moulting takes place, they will get a feed in shifting them, but after that they are not fed until nearly all are awake and then fed altogether for the purpose of equalizing them. If a portion of the worms are more backward than others, the best plan is to keep them separate, and feed them more frequently than the others, so as to advance them. The attention of equalization is of great importance, because if unequal it will cause great inconvenience, and loss of worms, consequently it is essential in every stage, to try and see that they are as near as possible equally advanced. In each cleaning out, or shifting of worms into clean trays, some sickly worms will be found in the "bed," which are better destroyed. The cleaning out of the "beds" is done once in every stage, except in the last stage, when they are cleaned twice.

The usual size of the perforated paper is 2½ feet long and 14 inches wide, with holes of five-eighth of an inch; and the nettiug, the holes are usually seveu-eighth of an inch. The perforated paper or nets are placed over the worms, not in contact with, but about three eighths of an inch above them. Silkworms require well-lighted rooms, but direct rays of the sun are injurious to them. In the third stage the temperature is kept at 70 degrees, and in the fourth and fifth at 68 degrees. When the worms are asleep or in a state of lethargy, they lay quiet with their heads upright, and don't like to be disturbed. In all the stages the same work and attention is required, as explained in the first stage. When the worms are young there is very little labour. Where the most labour is wanted is at the last stage, as the following table will show :—A person can attend in the first stage to worms from 10 ounces of eggs ; in the second stage six ounces ; in the third stage three and a half ounces ; in the fourth stage two ounces ; in the fifth stage one and a half ounce.

Leaves required for one ounce of eggs is as follow :—

For the 1st stage	...	...	...	...	8lbs.
,, 2nd ,,	...	...	...	...	26lbs.
,, 3rd ,,	...	...	...	...	80lbs.
,, 4th ,,	...	...	...	...	240lbs.
,, 5th ,,	...	...	...	...	1494lbs.
Total	...	...	...	...	1848lbs.

When the worms are fed in large numbers during the fifth stage, as soon as the leaves are laid on the trays, they cause a sound in the room, when eating, similar to rain. It is necessary to retard the hatching of the eggs until the leaves appear on the trees full-grown and strong, for tender leaves are not very wholesome and cause sickness. The appliances required in a silkworm-room are :—A small hand tray to carry the worms when shifting them ; a ladder to reach the upper trays ; a hand-basket, a knife, a barometer and a few other things. It will take about 15 pounds of leaves to produce one pound of cocoons.

Spinning of Cocoons.

In the fifth stage the worms consume at least four times more leaves than in the former four stages, but at the end of the eight days of this stage this great appetite soon diminishes, and the worms begin to lose their size and colour, becoming semi-transparent, and then cease to eat, and become restless and are seen moving in all directions, which indicates that they are looking for a suitable place to build the cocoons. When the worms start spinning, the temperature is kept at 77 degrees, until the cocoon is finished. As soon as the worms are looking for a place to build the cocoon, no time must be lost in fixing the twigs, or other things specially prepared for the purpose of spinning the cocoons in. For beginners the cheapest and simplest way is to adopt the twig system. Usually the twigs are fixed up in the trays on the sixth day of the last stage as follows:—The twigs are placed between the trays in the shape of arches, extended right across and along the tray. The arches are made about 15 inches wide, and the branches must be carefully spread in such a manner as not to leave too much space ; neither

should they be too close together, but just sufficient space to comfortably build the cocoons in,—because if a worm starts making the cocoon in a large space, he has to waste a good deal of silk thread in which to place his cocoon in, and if he starts in a small space, very often he leaves that place as uncomfortable, to start in another, so wasting a lot of floss, instead of putting the silk into the cocoon. When the trays are practically prepared with the twigs, the worms will soon find their way up, busily looking for a suitable place to build their cocoons. As worms never start spinning all at the same time, the feeding must be continued, but the leaves must gradually diminish in proportion to the decrease of the worms. If any worms retard more than three days from the first, it is best to separate them. When the worms are spinning, care must be taken not to disturb them, as a shake of the trays will cause the worms to break the depositing silk thread of the cocoon. Sometimes a shake caused by earthquake or thunder causes much damage, for when the thread is broken the worms frequently cease operations.

The silk-producing organs of the worms are two large glands, called sericteria, containing the silk substance, a glutinous liquid matter, which extends along the back part of the body, transparently visible. These glands terminate in two small spineret orifices in the mouth from which the worm draws the glutinous fluid silk from the two separate glands, and builds the cocoon by uniting the two glutinous substances into a solid and inseparable thread. After seven or eight days from the first day of spinning, the cocoons are ready to be collected, and if, on shaking the cocoon a rattling sound is heard, that is a proof that the worm is transformed into chrysalis and has done its work. The average size of a cocoon is a pigeon's egg, and the fibre contained in it often exceeds 2000 feet in length. The cocoons, as soon as they are finished, will gradually decrease in weight. In ten days they will lose over 7½ per cent. All full-grown worms that might have died without spinning can be utilized to obtain what is called silk-gut, which is commonly used for fishing purposes. The dead or cat-gut worms are placed in strong vinegar, and left there for about 48 hours, when they are broken in two, and two pieces of silk substance are obtained, which is drawn out in lengths and left to dry. The worms from one ounce of eggs of the best kind, and properly governed, will produce from 130 to 150 pounds of cocoons.

Gathering of the Cocoons.

After the seventh or eighth day from the first day of spinning, the cocoons are ready to be collected. They are placed in baskets that hold about 15 pounds of cocoons. In collecting the cocoons, they must be handled carefully, and not thrown from any height or distance, as it may cause death to the chrysalis, which would become dry, reducing the weight of the cocoons and therefore a loss to the owner. When the cocoons are collected they are assorted, and all bad ones, and those in any way defective are put aside, and all the saleable ones are placed into trays in layers, of not more than six inches deep. The cocoons must be sold within 13 days of the collection, for if retained beyond that time, there is the danger of the moths piercing through the cocoons and consequently spoiling the

silk. Sericulturists who cultivate say from 4 to 100 ounces lose no time in selling the cocoons, for the longer they are kept the greater will be the loss in weight, as above mentioned.

Many unpractical persons have an idea that the reeling of the cocoons is done by the grower or farmer. A greater mistake could not possibly be made, because the reeling process is one of the most delicate and of such importance that it can only be properly done by adapted machinery in silk manufactories. To attempt the reeling by farmers is simply reducing the silk to an inferior quality, and greatly reducing its value. A market for cocoons is to be found close handy in any part of the world, and has a ready sale, the same as selling gold. At the present time there are persons in Melbourne ready to buy any quantity of cocoons. In any extraordinary cases where a market is difficult to be obtained, it would be necessary to smother or kill the chrysalis, so to prevent the danger of the moths piercing the cocoons, and this can be done by putting the cocoons in an oven at a degree 120 F. for twenty minutes, laying them on boards, and being careful to avoid scorching them. The cocoons must then be removed and spread out to dry, as a certain amount of dampness will be contained from the chrysalis. To make sure that the chrysalis is dead, cut two or three cocoons, then test the chrysalis with a small hot iron. If they move under this process, of course they are still alive. In the silk manufactories the chrysalis is killed principally by steam in a scientific systematical manner. When the cocoons are collected, the trays, twigs, and all appliances are cleared out of the room and stored away in a suitable place to be ready for the next season.

Selection of Cocoons for the Supply of Eggs for the following Season.

Before the cocoons are sold, or the chrysalis killed, as befor stated, a selection is made from them, and for every ounce of eggs that is required for the next season, about 360 cocoons are picked, and only the best formed and hard ones, with a healthy appearance and of uniform size. Out of the 360 cocoons, it is expected to obtain an equal number of male and female moths—that is, 180 of each. The cocoons of females are generally of larger size, whereas the cocoons of males are smaller and narrow in the centre. A practical person will pick pretty near an equal number of the sexes, by observing this rule. The cocoons are placed on a tray well spread out at a temperature of 77deg. F., and after the worms have been in prison in the cocoons for about 22 days, they re-appear in the form of the moths, which will pierce through and emerge from the cocoons, which takes place generally in the morning early; the empty cocoons, will then be reduced to one-seventh of their original weight. As soon as the moths appear, they are carefully taken by the wings and placed in a ventilated covered box, keeping the males separate from the females. The male moth can be easily recognised, as it is much smaller than the female, and very lively, while the female is large and very quiet. The moths are then placed on a substantial linen cloth, well washed, with a smooth surface, stretched on a frame and placed in a slanting position. All inferior moths, with an unhealthy appearance, or with any defect

whatever, must be rejected. Every pair of moths are then placed on the cloth at about one and a half inches apart. As soon as the pairs separate, the males are removed and not to be used again, and no pair allowed to be united more than six hours. The moths will lay eggs for about four hours, and will lay one egg in every five seconds. Each moth will lay an average of 250 eggs, but a good healthy moth will lay as many as 400. If any white cocoons be chosen for eggs they must be pure white. The eggs, when laid, have a yellow colour, but after three days they become of a slate colour. When the moths have done laying the eggs, the cloth is allowed to get well dried, then carefully rolled up and put away in a fresh, dry and ventilated place, secured from rats, mice, ants, spiders and other insects.

Producing Silkworm Eggs for Sale.

The speculation of producing eggs for sale is of far more importance and remunerative than selling the cocoons, if a market could be procured for them. Japan has supplied Europe with many million pounds sterling worth of eggs, for about twenty years. When the disastrous disease was raging amongst the silkworms, Italy alone sent to Japan £1,150,000 annually. From one ounce of eggs, or from the moths of one ounce of eggs, 70 ounces of eggs will be reprodnced. The price of eggs varies very much according to quality and circumstances: they are sold at from 10s. to £2 per ounce. I saw a report in the *Reforma* of the 30th March, 1894, from Switzerland. The selling price was 14s. per ounce. So the reproduction from one ounce of eggs (that is, 70 ounces), if sold at that rate, would give a return of £49 Eggs produced in a new country are preferable to others, being more healthy than the eggs produced in old countries, and commands better prices, and why should not the Australian Colonies be great exporters of silkworm eggs?

Will Silk-culture Pay in Australia?

If a farmer plants, say, one acre of land with mulberry trees, and he will also utilize the land for the production of other crops, the mulberry trees would be planted at 30 feet apart. In an acre he can plant 48 trees at the above distance, and when about three years old he can begin to utilize the leaves to feed the worms, and when they are about eight years old they will produce about 5000 pounds of leaves; with that he can feed worms from three ounces of eggs. The worms for three ounces of eggs will produce about 400 pounds of cocoons. When the farmer is once in possession of the mulberry trees and the other few requisites, he has scarcely any further expenses in connection with it, except the light labour and short attendance supplied by the farmer's family for about four weeks at the most idle time of the year amongst the farmers. The price of cocoons of late years has been very low, and fluctuated very much. I have seen reported in the journal, *Lyon*, at Lyons, in France, dated 30th of May, 1893, that the cocoons were sold at two shillings per pound. Also reported in the *Reforma* of the 24th June, 1894, that cocoons were sold in Stradella, Italy, at 1s. 6d. per pound, and inferior cocoons were sold for less. Now if 400 pounds of cocoons would fetch in the market, say, 1s. 6d. per pound, that

would bring in £30 to the farmer for the labour, or, rather, amusement of two or three persons for about four weeks in attending the silkworms, besides the revenue that he would obtain from other crops that he may cultivate, such as beetroot, potatoes, maize, hemp, etc. Beginners in silk-culture need not be very particular in regard to the strict governing of the silkworm, for good results are obtained in carrying on in a simple and primitive mode; but as people will gain knowledge on the importance and extension of the industry, naturally the best principle and most strict attention will be observed.

Importance of the Silk-culture Industry.

In support of the great importance of the silk-culture industry, it is sufficient to observe that every country where the industry has been established, beginning with China (which dates as far back as the year 2640 B.C.) and in Europe four centuries ago, that in no nation has it been abandoned, but it has been continually making progress to the great advantage of individuals and nations.

The United States is one of the latest countries that has introduced silk culture with a wonderful progress, and here we can favourably compare the social and natural condition of the Australian Colonies to that country, and why should we retard its introduction, and neglect to provide one of the most interesting, agreeable and pleasant occupations for the farmers' families? The chief difficulty to contend with in the introduction of this industry into a new country, is the impatience to realize profit for a length of time, and before they learn the art of making a very good crop of cocoons; also that the people here do not know anything about it, and for other imaginary difficulties. In answer to that, I can only compare the same objections that were raised in wine-growing. In the early days of the colony I don't suppose there was one in a thousand that knew anything about wine-growing – But what do we see to-day? That some of the best vineyards in the colony have been established by Irish, Scotch and English people that (I suppose) knew nothing about viticulture, and they had to wait three or four years before getting any return. Viticulture is far more expensive, more risky, and it is difficult to get a market for the wine; whereas in silk culture it requires little labour, very little risk and a ready market and generally cash transactions. At the same time, the wine industry of this colony is one of the most important of all colonial industries; and I affirm that if silk-culture be largely undertaken and established in the colony, that it would be adding a perpetual wealth to individuals and to the nation.

Silk Production in the Following Countries.

Italy produces £12,000,000 worth of cocoons.
France produces £2,500,000 worth of cocoons.
England imports and manufactures for £11,500,000 worth.
China exports 10,000,000lbs. of silk.
America in 1880 produced silk goods to the value of £6 800,000, and 10 years afterwards, that is in 1890, with the assistance of Protection, the value of the silk goods production has exceeded £13,800,000, with 385 factories established.
France produces manufactured goods to the value of £25,000,000.

An American Report on the advantages and progress of the Silk Culture in 1884.

As the climate, social, and commercial conditions of the Australian Colonies are similar to those of the United States, I think the report will show the people of Victoria the necessity to follow similiar steps as adopted in the States.

The report includes a copy of "an act to establish a state board of silk culture and to provide moneys for the expenses thereof," which was passed on the 15th March, 1883, enacting:—1st. That there shall be established a state board of silk culture, consisting of nine persons appointed by the Governor from the State at large, five at least of whom shall be members of the Ladies' Silk Culture Society of California. 2nd. The board may receive, manage, and use donations or bequests for promoting silk culture in this state. The board shall establish, as soon as practicable, a filature or silk reeling school in San Francisco, Sacramento or Stockton, wherein free instruction shall be given in silk reeling. 3rd The secretary, in addition to performing such official duties as the board may direct, shall collect statistics and other information showing the condition and progress of sericulture throughout the state; correspond with various societies and individuals, both at home and abroad, who are engaged in the promotion of silk culture, and shall prepare a full report thereof, to be made to the board annually for their publication; and shall receive for all such services a salary not to exceed 100 dollars per month 4th. The board shall, biennially, *i.e.* the month of January, report to the Legislature a detailed statement of its work. The report so made shall, under the direction of the controller, be printed in pamphlet form, not to exceed 50 printed pages, and not to exceed 2000 copies thereof, to be distributed as the board may direct All printing required to be done by the board for their official use, shall be done by the state printer. 5th. There is hereby appropriated for the use of the state board of silk culture, as set forth in this act, out of any moneys in the state treasury not otherwise appropriated, the sum of 5000 dollars for the year commencing the 1st of April, 1883; and 2500 dollars for the year commencing the 1st of April, 1884; and the state controller will draw his warrants upon the state treasurer in favor of the treasurer of the board, as such officer, for the said sums, or any part thereof, when they become available, upon the proper demand of the said board.

Between California and Victoria there is a singular similarity as to the climate and other conditions, and thus the instructive sketch which begins the report is of special interest to our readers, where the secretary says the silk industry of California is still in its infancy. Enough, however, has been done to show that there are millions of dollars in it for those who will intelligently and patiently prosecute. European silk culturists who have made California their home are enthusiastic in respect to our soil and climate. They find our conditions for silk culture preferable to Italy or France. Our freedom from thunderstorms is highly favorable to the growth and health of the silk worm. There are critical periods in the life of this wonderful insect, when a violent thunderstorm will destroy millions

of them in a moment. Families in Europe, whose chief support is derived from this industry, will sometimes lose an entire brood, worth hundreds of dollars, during the progress of a sudden and violent thunderstorm. Our Californian culturists are happily exempt from danger on account of these electrical disturbances. During the months of May and June (corresponding with November and December in Victoria), the best period for silk culture in California, the sound of thunder is rarely ever heard in any part of the State. Nearly thirty years ago the importance of this industry began to press its claims. In 1856 Louis Provost, at San José, commenced the planting of mulberry trees. He was the pioneer in this work, and before his death he published a manual, in 1867, on silk culture, the effect of which was to induce many persons to engage in the enterprise. Another silk culture pioneer was Adolph Mueller, also of San José. He began the work about the same time with Mr. Provost. He continued it until his death, in 1869, and his success was a great encouragement to others. John E. Gonx, Mr. A. Packard, and Dr. Ord entered upon this industry in 1860 at Santa Barbara, and were very successful in producing fine cocoons, but there being no filature and no market for their product, the business was given up. In 1865, the Legislature of California recognised the importance of silk culture by offering a bounty of 250 dollars to any person who should plant 5000 mulberry trees, and another bounty of 300 dollars to any one who should produce 100,000 cocoons. It was a patriotic and well meant purpose on the part of the Legislature. If it had at the same time provided means for a filature for the purpose of extracting the raw silk from the cocoons, silk culture would long ago have become an established industry. But it was a work so entirely new to rulers and people at that time that this necessity for success was neither understood nor provided for. Still the generous offer of the Legislature was not in vain. A large number of persons were induced to plant trees and raise cocoons. In Sacramento, Santa Clara, Sonoma, Nevada, Napo, Contra Costa, Marin, Alameda, Los Angeles and other counties, thousands of mulberry trees were planted, and in two years cocoons began to be raised in considerable quantities, increasing during the next three years until the product amounted to several hundred thousand. In 1868, W. M. Haynie and I. N. Hong, of Sacramento, raised over 800,000 cocoons, and received the State's bounty. In 1870 a company at Davisville is reported to have produced 4000 lb. of cocoons worth 5000 dollars. The expense of the experiment is said to be not more than 1500 dollars. In the same year T. B. Flint of Sacrimento, it is stated, raised 900 lb. The product of Mr. Hoag was 650,000 cocoons. It is estimated that 20,000 oz. of silk worm eggs were produced that year in California. There being no market for the cocoons, the main object of the producers, from 1865 to 1870, was to secure the bounty of the State for trees and cocoons, and to raise silk worm eggs for culturists in Europe. The war between France and Germany unfortunately closed the market for the sale of eggs. The product of 1870, worth not less than 100,000 dollars, was thus left on the hands of the producers, and, there being no market in the United States for their cocoons, our pioneer silk culturists became discouraged. Tens of thousands of valuable trees

were soon after destroyed. The infant industry, after such a hopeful beginning, was left to languish for years.

At the Centennial Exhibition, held in Philadelphia in 1876, California was represented by a silk culture display. Mr. Neumann and Mrs. Keeney collected specimens of our cocoons, and took with them to the East two flags made by Mr. Neumann of American grown silk and some skeins of reeled silk, and illustrated the industry by a display of silk worms, in their various stages of development. Our cocoons, it is said, were examined by Professor Henry, of the Smithsonian Institution at Washington, who pronounced them superior to any that he had ever seen. The President of the United States is also reported to have been so favorably impressed with the conviction that this industry should be built up in California, that he was willing to favor an appropriation of 20,000 dollars from the agricultural gifts to the states for the encouragement of silk culture in California. But the most happy result of the exhibit at the Centennial was the interest created in the minds of a number of influential ladies. They were subsequently induced to organise the Woman's Silk Culture Association of the United States, having for its object the gratuitous dissemination of information on this subject, and the building up of silk culture as an American industry for the benefit of American women.

While women in Eastern States were moving to build up this new industry, a large number of patriotic ladies in California organised an association for the same object. The years 1879 and 1880 saw thousands of our people unemployed. Men paraded the streets of our cities asking for work. Hungry women and children were begging for bread. Mrs. T. H. Hittel, of San Francisco, read a paper before the Horticultural Society, showing the importance of silk culture. Another article on the same subject, prepared by her, was read by Dr. C. A. Buckbee before the Academy of Sciences. In these discussions it was shown that the industry could be worth millions to the State, and help tens of thousands of women and girls to earn their bread. A score of patriotic ladies organised the California Silk Culture Association. Correspondence was opened with silk growers in many lands. Information was given to the people; manuals of instruction were published. Many women began the work, and in two years good cocoons had been raised in thirty two different counties. This association found in 1882 that it needed some powerful aid. A filature was absolutely necessary, to which the cocoons might be sent, the raw silk extracted from them, and the work of the people put in a condition suitable for manufacturing purposes.

In this emergency an appeal was made to the Legislature of California. The State Government determined once more to reach forth a helping hand to this industry. It appropriated 5000 dollars for the first year and 2500 dollars for the second year and created a State Board of Silk Culture to administer the trust. This important commission was directed to establish a Filature with as little delay as possible. It began its work in May last, too late to give all the assurance to culturists throughout the State that they needed, that there would be a market for their product; but in time to remunerate all who prosecuted the work. The State board, fortunately, is not

limited to any one department of the enterprise. Whatever will contribute to encourage and establish this great industry receives encouragement. It procures seed, cuttings and young rooted mulberry trees, and the best varieties of silk worm eggs, which it supplies gratuitously or for a nominal price, in limited quantities, to all applicants. It collects and sends abroad information of great value to the people. It has opened its Filature and Silk-reeling School and given instruction in the art of reeling to eleven young ladies, who will be able next year to act as independent reelers. It is intended to educate and prepare teachers for the orphan and charitable institutions of California, so that their inmates may help to support themselves by means of silk culture and silk reeling. It is the hope of the State board that it may be able to lay foundations for Filatures in Los Angeles, San José, Stockton, Sacramento, and perhaps other parts of the State. It has already received over 500 lb. of cocoons, and produced about 30 lb. of beautiful silk, which is said by manufacturers to be of an excellent quality. In addition to what has been received at the Filature, 100 lb. of cocoons have been sent East by one of our silk raisers in San José. It is known that several hundred pounds have been raised for the production of eggs for foreign countries. We estimate that not less than 1500 lb. of cocoons were raised this year.

An experimental station is one of the projects of the State board, where mulberry trees adapted to any climate shall be planted and cultivated according to the best known principles, the different varieties of silk worms to be treated, a suitable cocoonery erected as a model for the State, and where parties wishing instruction in silk culture are to be taught in all the mystery of this wonderful industry For such a station not less than 100 acres, suitably located and accessible by railroad, will be requisite. The number of persons who will enter upon the work next year is not known, but the applications for aid are many. Not less than 20,000 cuttings and trees will be needed to supply those whose requests are already on the file. The State Filature already established has two steam reels and one hand reel. It is estimated that six or eight new reels will be needed for next years operations. Now that this institution has been established by the State, and the product of the people can be utilised, there is no reason why every farmer should not encourage his family to engage in the work. As soon as the product of the State will be sufficient to keep sixty reels in operation, the Filature will have become self-sustaining, and the generosity of the State will have made silk culture one of our most profitable industries.

Silk culture is the special work of women, girls, young boys, the infirm, and aged persons. There are so few industries for women that this great enterprise would seem to be a godsend to them. Any mother with the aid of two or three children, can earn 50 dollars in the six weeks required for raising silk worms. She can do this without intefering with her ordinary household duties. There is no hard work about it. After two or three years successful experiments, she can increase the sum earned to 200 or 300 dollars But for the earning of such a sum she would need the help of one or two men for a couple of weeks. The first thing required is to plant a few mulberry trees. The best kind is the *morus alba*, or white mulberry,

of which there are many varieties. They should be set out as a hedge, about ten feet apart, near the house, around the garden, or in rows by the roadside. In two years the first experiment in raising silk can be made. Fifty trees are enough to begin with. Cuttings are better than seed; they root easily and grow rapidly. They should be trimmed and not allowed to grow higher than 10 feet, so that the leaves can be easily picked by young persons. As the industry is to be prosecuted by women, the trees should be grown as near to the home as possible. The next step in preparation is a suitable room for a cocoonery, airy and clean. In Europe housewives often use a garret or some other part of their houses, but it is better to have a cocoonery. A building 20 x 40ft. would suffice to rear 100,000 worms. The building can be used ten months in the year as a storeroom, a carriage house, or some other farm purpose. For silk culture it would only be needed in the two first summer months.

This industry is capable of giving employment to every unemployed woman and girl in the state. It is pleasant and profitable, and just suited to fill up the leisure hours in our rural homes. The women and children of the family can earn a nice little sum of money for themselves. They can thus contribute something to the productive wealth of the State; they can make themselves richer and their homes happier; for industrious homes are happier than the homes of the idle. Vast numbers of our boys and girls are profitably employed a few weeks in the year in fruit picking and canning, but this gives no steady work. When silk culture becomes general in the State it will give work for two months to all these idle hands. Then when the canning season is over, the rest of the season can be profitably employed in silk reeling in some Filature; for Filatures must eventually become established institutions in different parts of the State, in which tens of thousands of our daughters will find permanent, pleasant and profitable employment. The best ladies in France and other European countries may be found engaged in silk culture every year. France and Italy make nearly 100,000,000 of dollars annually by this industry; and nearly all the work is performed by women and young people. The demand for raw silk is immense. The manufactures of the world require about 400,000,000 dollars worth every year, and this demand is increasing. The factories in the United States produce 80,000,000 dollars worth of silk fabrics annually.

There are now two silk factories in California, both doing a good and growing business—one is located at San Francisco, the other at San José. The establishment at San Francisco is managed by Messrs. Carlson and Currier, for the production of Belding's and Californian silks. It has been in successful operation since February last and is located at the corner of Stephenson and Ecker streets, in the heart of San Francisco. It gives employment to forty persons—mostly boys and girls. We understand that the machinery and appliances of the establishment are worth about 10,000 dollars; but the purpose is to erect a large and suitable building, as soon as the demand for their goods will justify it, for making twisted or spooled silk, ribbons, and other fabrics. The pay roll of the factory is about 1000 dollars a month; a ready market is

found for all that is produced. They are so anxious for the success of silk culture in California that they are willing to pay 25 per cent. above the highest market price for the next three years for all the raw silk of Californian growth that is suitable to their uses. The San José silk factory confines its work to dress silks. It is owned by two experienced silk workers—A. F. Sauffrignon and H. X. Van de Casteele. They are working 10 looms, employ from 10 to 20 hands, and are now finishing from 60 to 70 yards of dress goods every day. Stores in Sacramento, Marysville, Stockton, Los Angeles, San José, Merced and Salinas, find their goods popular. They are building up a reputation for honest silks, giving employment to our own boys and girls, and believe there is a grand future for the silk industry in California.

A copy of the first out of nine letters that I have published in the "Age," of the 18th April, 1893, on the importance of Silk Culture:—

SIR GEORGE VERDON AND THE SILK INDUSTRY.

TO THE EDITOR OF THE AGE.

SIR,—In reading the report of the Wine, Fruit and Grain Exhibition, on the 23rd ult., I see that the president, Sir George Verdon, in his address to the Acting-Governor, spoke as follows: "If the people will be content to make their homes in the country, and if their efforts are wisely directed, there need be no fear for the future of Australia; but agreeable and interesting occupation seems to be one of the greatest necessities to make rural life attractive, as it is in Southern Europe. The ordinary work of the farmer who grows nothing but cereals perhaps lacks this quality, but if there be added a dairy, an orchard, a garden, and the cultivation of silk, there would be pleasant employment for the women and children of the family, while the profit of the farmer would be greatly increased." If you will allow me space in your valuable columns, I wish to deal with the question of the silk industry. My practical experience in sericiculture dates from a tender age. I was born and bred on a farm belonging to the family, in Switzerland, where the silk industry was carried on every year. We had mulberry trees to feed about 4oz. of silkworm eggs. In 1855 I came to this colony, and thence in 1868 to New Zealand, where I strongly advocated the introduction of this industry since 1874. On the 8th October, 1880, I read a paper on sericiculture at the Christchurch Philosophical Institute, when, in criticising, one gentleman stated that it was tried in Victoria and in the United States of America, where it ended in failure. That I admitted, and gave my reason for it, which I will hereafter mention. After some agitation, the Government of New Zealand decided to appoint an Italian gentleman with a full knowledge of sericiculture to try the experiment. He procured some silkworms from Japan, and also some of the so-called Italian

sort from my brother in Daylesford. The signor went to work with full confidence, and the result was a success beyond expectation, both as to the quality and quantity of the silk, and the superior condition and health of the worms. All this was exhibited at the New Zealand Exhibition. Since then a few citizens who possessed mulberry trees made experiments, with good results, which were exhibited at a local exhibition at Christchurch in 1884. All this went to prove beyond doubt the facilities and climatic advantages for this important industry, and as Sir George Verdon remarked, "it would find pleasant employment for the women and children of the family, and greatly increase the farmer's profits." Now, as to the failure of sericiculture in Victoria, I believe that about 17 years ago a large company was formed in Melbourne to carry on this industry, but it soon collapsed, owing to being over-officered and subjected to too many useless formalities, and left a want of confidence behind in one of the most important industries of Southern Europe. The same reason has retarded sericiculture in the United States for about 40 years, but some years ago they made a fresh attempt on a proper basis, and now are making great progress with a lively public spirit, and it is at present a great silk producing country. In California millions of mulberry trees are planted every year by private farmers. Why does this fine colony not follow the example of America? If it pays there it ought to pay here. If the farmers of Victoria will follow the example of the Americans, and plant a limited number of mulberry trees, and allow five years for their growth, they can utilise them in the cultivation of silkworms, which is very simple in its process. One of the drawbacks in starting this industry is that a return cannot be obtained for five years from the planting of the trees, but the same objection applies to all fruit trees, vines, &c. The necessary attention to the cultivation of these silkworms is required late in the spring, a time most available for farmers. They have nothing to do but plant the trees, produce the cocoons, and sell them to the manufacturers, they performing the rest of silk manipulation. To cultivate the silkworms up to the production of the cocoons will last only five weeks. One person can easily attend to the worms of an ounce of eggs, which will produce about 100lb. of cocoons. If required for breeding purposes 1oz. of eggs would reproduce 70oz. The price of eggs would vary in accordance to the demand, but I read in the English journal, *Land and Water*, of 12th January, 1887, where Captain Mason stated that silkworm eggs were worth in Europe from 15s. to £2 per oz. if produced in a healthy country. Trusting the importance of this question will be duly considered, and the attention of the farmers drawn to it, and that the Government will provide facilities for this and other industries, not only to make the country self-supporting, but to carry her head proudly as one of the great exporting countries of the world.

Yours, etc,

LEONARD POZZI.

40 Johnston-street, Fitzroy.

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